

EPC-TKS 2013

Learning satisfaction: validity and reliability testing for students' learning satisfaction questionnaire (SLSQ)

Ioana Topala^{a*}, Simona Tomozii^a

^a*Department of Psychology and Educational Formation, Transilvania University, Brasov, Romania*

Abstract

The present paper discusses the elaboration -based on factors identified in the researched literature- and the first steps in the validation process of *students' learning satisfaction questionnaire (SLSQ)*. A sample of 80 students, ages ranging from 25 to 57, participated in this initial phase of the research. The developed instrument consists of 26 items grading on a six-points Likert scale the level of satisfaction that students feel regarding different aspects of learning. Data processing consisted in factor analysis for validation and the calculation of the Cronbach's alpha coefficient for establishing reliability.

© 2014 The Authors. Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Selection and peer-review under responsibility of Petroleum-Gas University of Ploiesti, Education Sciences Department.

Keywords: learning satisfaction; factor analysis; student; factor; Cronbach's alpha coefficient.

1. Introduction

When trying to approach the concept of learning satisfaction, the researcher faces a lack of consensus that normally gives the necessary consistency for defining the notion and identifying the implicit psychological constructs (certain elements, somewhat hidden features). This leads to the hardship of developing a general or commonly accepted theoretical frame for analysis and interpretation.

* Corresponding author.

E-mail address: ioana.topala@gmail.com

Nevertheless, we dare to presume that learning satisfaction can be seen as similar and thus defined by reference to work satisfaction. That assumption is made due to the fact that both work and learning are forms of human activity, alongside play and creation. Similar to work activities, people use evaluative internal systems to assess whether they are satisfied with their learning activities or not. These internal systems are in fact the attitudes which are complex evaluative statements concerning people, things, events (Robbins and Judge, 2007), pretty much everything around us. The previously cited authors note that job satisfaction is a major job-related attitude and place great importance on identifying organizational behaviors pertaining to it (Robbins and Judge, 2007). This been said, we can assume that the same logic applies for satisfaction regarding learning. Meaning that learning satisfaction will be referred to as a multifaceted attitude towards: learning environment and conditions, learning activities, learning outcomes and the peer relationships in learning.

This paper focuses on underlying through the help of empirical data the factors behind learning satisfaction, concept that will be refer to as a complex attitude, in the particular context of students' learning experiences during their academic endeavors. Our research sample consisted in 'non-traditional students' (Buerck, Malmstrom and Peppers, 2003) meaning adult individuals juggling different social roles and responsibilities, that join superior educational programs requiring learning autonomy, and who can decide on the conditions, amount and direction of their involvement in learning activities (Gorges, Kandler, 2011). This decision-making autonomy (Knowles et al., 2005) and self-directed engaging capacity make the adult-student (age 25+) a more reliable source for identifying attitude-patterns that shape concepts and research instruments such as SLSQ.

1.1. Learning satisfaction: a review

There is far from abundant written evidence demonstrating preoccupation for learning satisfaction per se, as an integrating concept suitable for a holistic approach. The majority of studies pertaining to satisfaction in the learning process or context are either referring to a non-specific, general feeling regarding an over-all process or a multifaceted context (e.g. 'How satisfied were you with this learning program'), or are narrowing it down to one or few aspects of the general attitude (e.g. 'How satisfied were with a certain evaluation procedure'). Thus, from our point of view, the challenge is to find the balance between a broad view that, even if easier to analyze offers less specific information regarding the exact sources of satisfaction or dissatisfaction, and the slightly too narrow one, which leaves parcels of knowledge uncovered.

Recent researches addressing this matter approach student satisfaction as related to teamwork, team performance and collaborative learning (e.g. Johnson, Top, Yukselturk, 2011; Fransen, Kirschner, Erkens, 2011; Ku, Wei Tseng, Akarasriworn, 2013), or regarding satisfaction with e-learning courses (e.g. Novo-Corti, Varela-Candamio, Ramil-Díaz, 2012) or virtual learning systems (Lin, 2012).

In the same note, Hoyt (1999) talks about the influence that students' satisfaction with the academic experiences and with the providing institution has on retention in higher education, while Astin (1993) adresses different aspects of students' undergraduate experience, underlying the determined correlations of variables such as student involvement, student-student interaction, student-faculty interaction, with over-all students' satisfaction.

In order to gain a greater understanding and for reasons that are connected to the difficulty and complexity of defining it, the concept of learning satisfaction will be approached through related, better-explained concepts, due to previously statistically demonstrated linkages.

Regarding this aspect, Chang and Chang (2012) make a review of various studies (including the one carried out by the two authors) which emphasize the strong association between learning motivation and learning satisfaction, presented under the form of positive significant correlations. In explicit terms, learning motivation is generated by a series of learning needs that the individual has, needs that, once satisfied, generate a complex state of mind, which can be characterized on a psychological level, in the words of Flammger (1991), as the joy of fulfillment and feeling of sufficiency, in the sense that the initial needs are diminished and the afferent psychological tension is reduced (Chang and Chang, 2012). This state can be identified with satisfaction.

Learning satisfaction has been seen in terms of affect, as a superior emotional complex, defined by the level of joy one feels when learning, this also being, in Long's (1985) opinion, first of the two goals that the adult students are trying to achieve by joining learning activities –the second being connected to the learning outcomes (Chang and Chang, 2012). The same authors quote Martin (1988) when identifying learning satisfaction with the level of

consistency or coherence between the individual's expectations and his actual experience. When his real experience is equal or succeeds his expectations, the individual feels satisfied, as opposed to an experience that is under his expectations and makes him feel unsatisfied (Chang and Chang, 2012).

Satisfaction is seen as a "spontaneous experience" that accompanies an intrinsically motivated behavior (Deci, Ryan, Williams, 1996), suggesting that, in order to be favorably assessed, teachers and the learning activities should relate to learners' motivational configuration as to a top-priority aspect.

In Arbaugh's (2000) opinion, learning satisfaction includes the individual's feelings and attitudes towards the education process and the perceived level of fulfillment connected to the individual's desire to learn, caused by the learning motivation (Chang and Chang, 2012). Harvey, Locke and Morey (2002) describe learning satisfaction as the pleasure resulted from student's implication in the specific activities suggested by the curricular designs, activities that lead to fulfilling the learning needs initially felt by the student. The same authors highlight the fact that individuals have different learning needs, focusing on different learning activities and obtaining, as a consequence, varying levels of learning satisfaction (Chang and Chang, 2012)

1.2. Factors of learning satisfaction

Regarding the factors that stipulate the learning satisfaction, we will review a series of authors and their contributions to clarifying the topic. Lam and Wong (1974) highlight the strong influence of the learning content on learning satisfaction, even if it leads to satisfying the learning needs of the students or not (Chien, 2007). Other factors, such as the degree of student's participation or the teaching abilities of the trainer and the individual characteristics of the student, also operate on learning satisfaction (Davis and Davis, 1990, cit in Chien, 2007). Kerwin (1981) draws attention on the impact of the location and the learning facilities, as well as the respect that the teacher shows to his students, have on the learning satisfaction (Chien, 2007, p.194). Binner et al. (1994) talk about the teacher's attitude toward training, the technology used, the course management, the staff, the support services and the informal communication (after-school communication) as factors that have a direct influence on learning satisfaction (Chien, 2007, p.194). In a study about a group of adult learners that were a part of a training program meant to help them acquire different computer skills, Huang (2002) used six sets of factors: teacher's teaching, class materials, learning results, interpersonal relationship, learning environment and administration (Chang and Chang, 2012). Likewise, Wei (2003) identifies four sets of factors when explaining learning satisfaction of adult learners that were engaged in different training programs within different faculties: teacher and teaching, course content, learning environment and administrative services, and Chen (1997) shows teacher's teaching, class materials, learning results, student-teacher interaction, peer relationship and support as major factors when talking about student's learning satisfaction (Chang and Chang, 2012).

From another point of view, Urdan and Weggen (2000) suggest six factors that can help measure student's satisfaction towards the educational process: teacher, course content, teacher's teaching, class materials and the quality and setting of the course (Chien, 2007, p.194). In an effort to synthesize the analyzed factors, Chien (2007) integrates a large amount of these (after prior established criteria) in five categories regarding the influence on learning satisfaction constructs, each category consisting of 25 elements: individual characteristics; teaching attitude and ability; course quality; learning environment; teaching purpose.

Khia (2013) speaks about four main categories of factors brought to light in a study on non-traditional (adults being involved in different social roles, besides that of a student) learners- desirable learning deliverables, direct learning related factors, lecturer/tutor factors, indirect learning related factors- stating that academic factors such as flexibility of learning and the characteristics of lecturer/tutor play the most important role in influencing students' learning satisfaction.

It's interesting to see that, as a result of some research over the relationship between learning motivation and learning satisfaction, the demographic variables were put on the table to show their important impact and the results were as follows: age has significant impact on learning satisfaction- the younger and older ages experience a higher degree of learning satisfaction following learning experiences (Day and Landon, 1997; Zaichowsky and Liefeld, 1997; Bearden and Manson, 1984, cit in Chang and Chang, 2012); the gender and the level of education have great

impact on just few of learning satisfaction factors –learning interests, course content, class materials and administrative services- identified and made operational (Chang and Chang, 2012).

2. Data and method

2.1. Setting and procedure

We will relate to the concept of learning satisfaction as being consistent with “a set of positive attitudes of the person” (Popescu-Neveanu, 1978, p.633) regarding learning as process (who, what, how, in what manner) and as product (what is the outcome of learning).

From the analysis and the synthesis of the current available researches, we acknowledge six factors assumed as valid indicators of learning satisfaction:

- individual characteristics,
- material conditions and learning facilities,
- the teacher and the instructional activity,
- learning outcomes,
- learning environment,
- peer relationships.

For an operational understanding, the assumed factors were 'decomposed' in dimensions that encompass the correspondent variables marked in the items of the compiled questionnaire. Giving the assumed factors' dimensions a 'behavioral look' resulted in a number of 26 items evaluating the self-perceived level of learning satisfaction, on a six-points Likert scale (from 1=very unsatisfied, to 6=very satisfied), in the form of a students' learning satisfaction questionnaire (SLSQ).

The study involved a sample of 80 individuals (N=80), ages ranging from 25 to 57 (M=37, SD=8,6), students of the Faculty of Psychology and Educational Sciences within the Transylvania University in Brasov. Participants were asked to assess their level of satisfaction regarding aspects pertaining to their learning experience in the university.

2.2. Analysis

In order to establish the validity of the SLSQ, the items of the instrument had been put through a factor analysis. First, a KMO test regarding the degree of suitability of the sample was run. The resulted value, 0802, indicated a suitable sample for factor analysis.

Moving on to establishing through dynamic statistics the number of the extracted factors, we followed Kaiser's criterion in retaining only the factors which showed explanatory power larger than the one of a single variable. A number of five factors were excerpted and considered valid (by Kaiser's rule- eigenvalue ≥ 1). This study had previously assumed the presence of six relevant factors of learning satisfaction.

In order to see the nature of the extracted factors and the degree of saturation of each item, we studied the matrix in which are presented the correlations between each item of the scale and the factors, extracted and rotated. Varimax rotation of the factors was applied in order to avoid the problems that could have appeared in interpreting results containing complex-structured items.

Because the sample is under 100 individuals, we considered, through a convention determined by the nature of the research conditions, the value 0,55 as the minimal value of the threshold from which, following Hair et al.(1998), it is thought that a factor influences a certain variable (Sava, 2011). Saturation values for items in the extracted and rotated factors ranged between 0,564 (for the "Respect and support shown by the teacher" item- Factor 2 extracted) and 0,878 (for the "Communication with your learning colleagues" item- Factor 3 extracted).

For the reliability test, Cronbach's alpha was calculated initially for each proposed factor of the SLSQ (Tabel 1).

Table 1. Reliability coefficients for the assumed factors

	Individual characteristics	Material conditions and learning facilities	The teacher and the instructional activity	Learning outcomes	Learning environment	Peer relationships
Cronbach's α	0,870	0,714	0,942	0,921	0,815	0,906

Subsequently, the reliability coefficient was calculated by introducing all 26 items of the scale. The value of the global Cronbach's alpha, 0,947, showed a good level of internal consistency for the SLSQ.

3. Results

In the process of factor analysis, a number of five factors passed the statistic test of validity. In an effort to interpret the outputs, we state that the available data have justified the presence of a commune structure between 2 of the 6 initially established factors. After a more detailed analysis of the factorial structure matrix, we have come to the conclusion that the two factors that were not properly discriminated are those initially defined as Learning outcomes and Individual Characteristics. In other words, the extracted factors partially correspond to the assumed factors, as follows (Tabel 2):

Table 2. Correspondence between assumed and extracted factors

	Individual characteristics	Material conditions and learning facilities	The teacher and the instructional activity	Learning outcomes	Learning environment	Peer relationships
Factor 1 extracted		x				
Factor 2 extracted					x	
Factor 3 extracted						x
Factor 4 extracted	x			x		
Factor 5 extracted			x			

The causes for this undifferentiated treatment may be connected to the fact that the variables considered representative for the two assumed to be independent factors had a strong correlation between them, which led to extracting only one factor. This means that, in the case of the two factors initially selected as indicators, there were not used the proper items in order to correspond to the principle of scarceness (Sava, 2011, p.161).

Observing the Cronbach's α coefficients in the case of eliminating each item, we can form an opinion regarding the relevance of certain items (variables) for the construct measured by the scale or a possible error given by the flawed structure of the item. These additional results can lead to a possible explanation regarding the nature and structure of Factor 4 extracted. We can conclude, for the moment and based on the present set of data, that this extracted factor comes close to the one initially named Learning Outcomes and that a further exploratory study might highlight the fact that, in learning satisfaction, the learning outcomes have a greater role than individual

characteristics. To the same extent, it might be shown that a greater depiction of the factor regarding Individual Characteristics through selecting variables with a higher saturation degree within the factor, may lead to extracting a number (same number) of 6 distinct factors and not 5, in order to explain learning satisfaction.

4. Conclusions

The concept of learning satisfaction has the disadvantage of lacking the sufficient consistency when trying to define it. It is approached and intensively studied by few authors because, perhaps, it is considered to be lacking a solid structure. In an attempt to find a reason for this conception, we assume that the learning satisfaction concept may be strongly influenced by cultural aspects. This condition generates a greater variation in definition landmarks and tends to push further away a consensus concerning its necessary theoretical framing.

The SLSQ was created with the main purpose of being a reliable and valid scale to measure learning satisfaction in students. After analyzing and processing the available data, establishing validity and internal consistency, we can detect a partial confirmation of the stated hypothesis regarding the existence of six indicating factors of learning satisfaction. The factor analysis has validated the existence of 5 factors, by not discriminating 2 factors of the 6 initially established. This may have come because of an error in the structure of the items, or because the extremely low discriminative power of some items, or even as a consequence of invoking of a factor that in reality didn't exist as itself.

Regarding the reliability of SLSQ, the Cronbach's alpha coefficient calculated for each factor (assumed or extracted), as well as for the entire scale, showed a good level of internal consistency for the developed instrument.

Without a doubt, there are improvements to be made in order to advance the research in the right direction, and these include: a significant enhancement of the number of participants to the study, considering that factor analysis procedure is sensitive and particular about the volume and characteristics of the used sample; cleansing the scale of ambiguous terms, or terms that were wrongly structured; developing items with better discriminating value and selecting those items with the highest explanatory weight within the extracted factors.

References

- Astin (1993). What Matters in College. *Liberal Education*, 79(4). doi: <http://search.epnet.com/login.aspx?direct=true&db=aph&an=9409260313>.
- Buerck, J.P., Malmstrom, T., Peppers, T. (2003). Learning Environments and Learning Styles: Non-traditional Student Enrollment and Success in an Internet-based versus a Lecture-based Computer Science Course. *Learning Environments Research*, 6(2), 137–155. Retrieved from <http://link.springer.com.ux4ll8xu6v.useaccesscontrol.com/article/10.1023%2FA%3A1024939002433>.
- Chang, I-Ying, Chang, Wan-Yu. (2012). The Effect of Student Learning Motivation on Learning Satisfaction. *International Journal of Organizational Innovation*, 4(3), 281-305. Retrieved from <http://search.proquest.com/docview/921995037?accountid=15533>
- Chien, Te-King. (2007). Using the Learning Satisfaction Improving Model to Enhance the Teaching Quality. *Quality Assurance in Education*, 15 (2), 192 – 214. doi:10.1108/09684880710748947.
- Deci, E.L., Ryan, R.M., Williams, G.C. (1996). Need-Satisfaction and the Self-Regulation of Learning. *Learning and Individual Differences*, 8(3), 165-183.
- Fransen, J., Kirschner, P.A., Erkens, G. (2011). Mediating team effectiveness in the context of collaborative learning: The importance of team and task awareness. *Computers in Human Behavior*, 27, 1103-1113. doi:10.1016/j.chb.2010.05.017.
- Gorges, J., Kandler, C. (2012). Adults' Learning Motivation: Expectancy of Success, Value, and the Role of Affective Memories. *Learning and Individual Differences*, 22, 610-617. doi:10.1016/j.lindif.2011.09.016.
- Hoyt, J.E. (1999). Remedial Education and Student Attrition. *Community College Review*, 27(51). doi: 10.1177/009155219902700203
- Johnson, T.E., Top, E., Yukselturk, E. (2011). Team shared mental model as a contributing factor to team performance and students' course satisfaction in blended courses. *Computers in Human Behavior*, 27, 2330-2338. doi:10.1016/j.chb.2011.07.012.
- Khiat, H. (2013). Conceptualisation of Learning Satisfaction Experienced by Non-traditional Learners in Singapore. *Educational Research e-Journal*, 2(2). doi: 10.5838/erej.2013.22.02.
- Knowles et al. (2005). *The Adult Learner. 3rd Edition*. San Diego: Elsevir.
- Ku, Heng-Yu, Wei Tseng, H., Akarasriworn, C. (2013). Collaboration factors, teamwork satisfaction, and student attitudes toward online collaborative learning. *Computers in Human Behavior*, 29, 922-929. <http://dx.doi.org/10.1016/j.chb.2012.12.019>.
- Lin, W-S. (2012). Perceived fit and satisfaction on web learning performance: IS continuance intention and task-technology fit perspectives. *International Journal of Human-Computer Studies*, 70, 498–507. doi:10.1016/j.ijhcs.2012.01.006.

- Novo-Corti, I., Varela-Candamio, L., Ramil-Díaz, M. (2012). E-learning and face to face mixed methodology: Evaluating effectiveness of e-learning and perceived satisfaction for a microeconomic course using the Moodle platform. *Computers in Human Behavior*, 29, 410-415. <http://dx.doi.org/10.1016/j.chb.2012.06.006>.
- Popescu-Neveanu, P. (1978). *Dicționar de psihologie*. București: Albatros.
- Robbins, S.P., Judge, A.T. (2007). *Organizational Behavior*. New Jersey: Pearson Prentice Hall.
- Sava, F. (2011). *Analiza datelor în cercetarea psihologică*. Cluj-Napoca: Sincron.